PANEL II: INCENTIVES FOR INNOVATION: AGRICULTURE, ENERGY AND THE PRIVATE SECTOR

MODERATED BY:

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TODD STERN: All right, welcome to our second panel. I think we can start now. I'll give you a two-second introduction of who I am. My name is Todd Stern. I'm a senior fellow at the Center for American Progress and also practice law here in Washington at Wilmer Cutler & Pickering and got involved with these issues back when I managed the climate change issue for President Clinton between 1997 and 1999, and certainly issues of renewable energy and bioenergy were matters that we were starting to focus on back then.

I think that from what we heard in the first panel this morning there's potentially a moment coming together for bioenergy based on a growing awareness of three different policy challenges which can all be addressed in ways through bioenergy.

One is – and again, we heard about all of these in some depth during the first panel, but one of these is the growing awareness of the economic and national security downsides of our oil dependency. Second is an understanding and, again, growing awareness that the subsidy programs that we have both undermine any effort to combat global poverty and are, in all likelihood, politically not sustainable in the world trade system. And third, as John in particular addressed this morning, the growing awareness of the real peril that we all face from the danger of climate change. And each of these problems can be addressed in a quite powerful way through a concerted effort to develop bioenergy.

And so, again, I think it is an interesting moment here. In our second panel today; we are going to be focusing on the viability of biobased energy, on the opportunities that it presents, and some of the policies that need to be put in motion by the government in order to develop the promise and potential of this kind of energy.

We have a terrific panel. We have a superbly qualified panel to address these issues. Immediately to my right is Read Smith, a farmer from Washington state and a co-chair of the Ag Energy Work Group, which has put forth a very striking vision for agriculture to provide fully 25 percent of the energy needs of this country by 2025.

Moving down the row here, Ralph Grossi is a third-generation family farmer from Marin County, California. He is president of the American Farmland Trust, whose mission is to protect farmland and promote farming practices that are sustainable and lead to a healthy environment.

To Ralph's right is John Ranieri, vice president and general manager for biobased materials at DuPont, which is, without any question, one of the world's leading companies in the development of biobased products.

And finally, Nathanael Greene is a senior policy analyst at the Natural Resources Defense Council and the lead author of a comprehensive and excellent report in 2004

called “Growing Energy.” And I want to thank all of our panelists for taking the time to come here and share your thoughts and perspectives with us today.

Read, let me start with you, if I can. You are a long-time farmer and this is certainly the kind of occupation that leads one to have one’s feet both literally and figuratively on the ground, and yet I think many people might look at the “25 by ‘25” vision as being a kind of pie-in-the-sky notion. So what I’d like to see if you could do with us a little bit is tell us about that vision and the opportunities that you see for the development of energy from agriculture.

J. READ SMITH: Thank you, Todd. I guess I think back to the ‘60s when a president said “We’re going to have a man on the moon in ten years,” and I guess I don’t see the “25 by ‘25” as quite that much of a stretch, but it’s certainly going to require the stars to align and we are going to need some help from everyone in this room to make certain that happens.

But the fact of the matter is, for agricultural forestry to contribute 25 percent of our country’s energy needs by the year 2025; it is going to be more than just biofuels. It’s certainly going to be wind, solar, methane, geothermal, and perhaps some things that we haven’t thought of yet to achieve that lofty goal. And it’s certainly going to be combined with many other things – efficiencies, conservation and so on – because we have to lower the bar as we build up the amount of renewables.

But I think that, as Todd said earlier, there is a kind of coming together of a lot of very strong forces, and this “25 by ‘25” campaign and the whole idea of becoming more energy independent is certainly a worthy national goal. And I guess that is – what we would like to do is to have our nation adopt a vision that would allow us to make this happen.

Technologically, it is very possible to achieve this goal even though it is going to require a lot of changes, but I think with all your help and with the country focusing on renewables for a change instead of relying on the old fossil-fuel model, we could achieve much more energy security than we have today.

MR. STERN: Let me just ask you a short follow-up. What is the – what do you envision as the kind of coalition that you’re – that you’re looking to put together to try to achieve that?

MR. SMITH: Well certainly there is no single sector that will make this happen by itself and I think our vision, from our steering committee of about 20 leaders from across the country, is to develop a very strong agricultural base and to make certain that agriculture and forestry interests are leading the effort to make this happen. In addition to that, it is going to take a large coalition of corporate America, of the environmental community, of all concerned citizens, of government, of our leaders. Everyone needs to recognize the value of this vision and to move forward in that direction.

MR. STERN: Okay, thanks. Ralph, let me turn to you, if I could. The mission of the American Farmland Trust is, as I noted in the brief introduction – by the way, full bios for everybody up here can be found in your books. But the mission of the American Farmland Trust is to protect farmland and ensure a future for agriculture and improve environmental stewardship. And I'm wondering if you can tell us how the development of renewable energy and biobased fuels factors into that mission and – and fits into your vision.

RALPH GROSSI: I'll try to, Todd, but, by the way, by way of further introduction, my first career was as a dairy farmer in Northern California, which is now a cattle operation, but in 1980 we built a methane digester and produced our own electricity for seven years – enough electricity to heat and light 60 residential homes. What is discouraging to me is that this country has taken a two-decade timeout from the development of alternative energy, so I hope we are getting back on track now.

Our organization has spent the last 25 years promoting incentive-based conservation programs to provide more opportunities for farmers and ranchers to be better stewards of the land, to give them the tools to do so, and to help farmers protect their land and pass it on to the next generation.

Farmers keep the best land in agriculture. I noted Dr. Clay's comment earlier about making sure the production occurs on the good land on this globe, and I think that's something that we've lost sight of as a country and as a world. We continually are pushing agriculture off the most productive land, particularly in this country, because our ancestors were very bright people: they settled on the best farmland, and so many of our cities are growing and sprawling on the best farmland in this country, pushing agriculture off the most productive land and onto marginal lands and that can only have long-term, serious consequences both for the environment and for our competitiveness as an agricultural industry.

No matter what the new technologies are that come along, I think we'd all like to be able to apply those technologies on the most productive land rather than on marginal lands. But having said that, we concluded a couple of years ago, after the passage of the '02 farm bill, that the next farm bill was probably going to be different, that the likelihood of another bill like '02 was pretty low. Circumstances have changed: pressure from the international community, budget pressure, increased transparency of the programs and where the money goes and, most importantly probably, the increasing unmet needs of agriculture. Agriculture has tremendous needs to support and strengthen its institution in the areas of research, environmental protection, food safety, food security; and those are big ticket items that also need support and, we believe, will have public support if we address those needs in future farm policy.

So as we've gone about the country holding workshops for farm leaders and talking to farmers over the past year, what we've heard is farmers want a safety net, of course, but they want a cost-effective safety net that doesn't overstimulate production. They like the concept of green payments, of being rewarded for the many other amenities

they produce: clean water, wildlife habitat, open space around our cities, these are all, by the way, farm products, but we don't have a very good structure for rewarding farmers for those products.

But one of the more exciting things we heard in these workshops with our producers around the country was the opportunities in the area of new markets for agricultural products and energy, renewable energy, was right at the top of that list. It came up in every workshop, as you might expect. We see it as one of a whole list of opportunities for agriculture to become more entrepreneurial, to be more market focused going forward, and maybe the time is right for a real renewable energy partnership with agriculture.

MR. STERN: Thanks very much.

John, we've heard a little bit about how the development of bioenergy could be a good thing for farmers, create new markets, could be a benefit for them. I wonder if you could tell us a little bit, give us a little bit of a business perspective, how business can benefit either, I would assume, either as a user of renewable biopower, biofuels, or as a producer of biobased products. And I wonder if you could tell us a little bit about what DuPont's doing, about what your vision of DuPont is going forward, and give us a business perspective from an industry leader.

JOHN RANIERI: It is a very interesting and really an important time that – we were talking in the hall – that we think is very much different than the late '70s when we had that same swing towards renewables. DuPont, ten years ago, (Chad Howard?), the chairman, made a commitment to have 25 percent of the revenues from non-depletable resources. And, if you look around, DuPont obviously is known for making – kind of the inventor of polymers and plastics, and all that is based on petrochemicals and chemistry and polymer science.

The next generation of polymers we see are coming from not petroleum, but from cornstarch, from sugar. You see in Brazil sugarcane being moved to ethanol and it being more of a use and less expensive than petrochemicals now, given the price points where they are, which you mentioned. The reason is, is that instead of using petrochemicals and chemistry, you use cornstarch which is converted to sugar or sugarcane. You feed a biological organism that would make ethanol or something else.

Now, just to give you an example, it's a much broader look at (then?), it's moving sugar, and sugar is a very good thing in that by definition it's renewable, and secondly, for sugar to be made by a plant, it takes in CO_2. That carbon is fixed. The sugar is made. You feed that sugar to a yeast that will make ethanol, it gets burned and the CO_2 goes back up. So it's a cycle. That's the whole difference.

Many people don't realize that – at least the general public, that what we are doing when we take petrochemicals out of the ground is, we pull out old carbon, we refine it, we make it into gasoline, we burn it, and that carbon goes into the atmosphere as

CO_2. It's like a big tailpipe coming out of the ground. So the fact that we use agricultural crops, we have a cycle. By definition, it's the right thing to do.

The question is, is how do we use biology to feed these fermenters to make something of value. That's not an easy thing to do. It takes partners and, our example, and I'll just very quickly say this one, is we're making the first material from DuPont from renewable resources and were spending a $100 million to build a fermenter in a partnership with Tate and Lyle, which is a sugar company.

They have a corn (inaudible) in Louden, Tennessee, and we're building a 100-million-pound fermenter to make the first of its kind that will produce a chemical that will make – from sugar that will make flooring, that will make textiles, that moves us away from petrochemicals, and that took partnerships. We started 10 years ago – partnered with a biotech company to come up with the organism that could be – the software could be engineered to make the chemical that would then be used to make the product: the carpets, the textiles, and flooring. That took seven years and a lot of hard work to take this organism to make that valuable product.

We had 500-fold production improvement by being able to work the software within that bacteria. Then we partnered with Tate and Lyle to build a fermenter and now we are going to be producing that next year at 100 million pounds of volume. Now, what's interesting about that is, by using sugar instead of using petrochemicals, we avoid the equivalent use of ten million gallons of gasoline for a material alone.

Sugar can really make a difference and not only are you making a product that will be competitive in the marketplace, because we have to give a return to our shareholders, but it's the right thing to do. It's far more sustainable. And I think now that the paradigm that we talk to now is you have to come up with a product that really has differentiatable value, but at the same time be sustainable. You can't do one without the other.

And I think good policy would encourage those kinds of different programs to come about and I guess we'll (build?) a biorefinery later, which is really one that the government had very good foresight three years ago in allowing us to partner with the government – us as the lead – to start looking at coming up with a biorefinery that would use other fuel forefront, and I think later on it would be good to discuss that.

MR. STERN: John, just as a follow up, what do you expect to be the market for the products you're – that will be generated from the fermenter that you're talking about?

MR. RANIERI: Well, two areas. The first one – the one I was describing – is the latest innovation and introduction of a polymer that would be made for flooring. If you go to some of the flooring stores – we've partnered with Mohawk – you'll see a Serona (ph), which is a polymer from DuPont. And next year when the fermenter comes online, it will be made from renewable resources that were made with a biological process. So it will be carpeting, textiles, engineering plastics – all those can be made from this high-

performance polymer, which its primary ingredient is, again, derived from the fermenter we're building with Tate and Lyle.

MR. STERN: Any issue of acceptance in the marketplace or –

MR. RANIERI: That's a good question. No, the interesting thing, DuPont knew of this polymer 50 years ago, but they could never make it at a price point that really would make sense in the marketplace. What's interesting about this one is biology can make propanediol, which is the primary ingredient, more effectively than chemistry, so not only do you get a high-quality product – the polymer – but you also get the environmental benefit.

So we think – and right now we're having good sales with Mohawk on the flooring that was just introduced; and secondly, we feel that we will get some type of green bonus, that consumers in America really are starting to care. There is a – I would never say that's the case looking at all the SUVs that are around. I mean, that's not the first thing you look at was, "how green is the product?" But America is really changing. People really are concerned. Europe and Japan probably were slightly ahead of the curve on that context, but we're having good pickup on the product, but we hope that we'll have even further pickup because of the environmentally green aspect.

MR. STERN: Great. Good.

Nathanael, let me turn to you for a minute. We've – all of the first three discussions we've had so far have been focused on – essentially on the economics of bioenergy. I wanted to see if we could talk with you for a minute about the energy and climate challenges that are facing the country. Again, John Podesta laid out quite well the real seriousness that I think people are increasingly understanding with respect to climate change, and climate – really global climate disruption. What part can biofuels play in dealing with that issue and issues of energy security?

NATHANAEL GREENE: Well, that I think is a really crucial question and it's – sort of – one of the questions that came up on the last panel. What are the facts and where's the proof that this is good for the environment?

MR. STERN: Right.

MR. GREENE: We started asking that question at NRDC about five years ago after seeing a number of studies come out looking forward and projecting a sustainable energy future, and each one of those has a big wedge devoted to biomass and – sort of asking what's behind that wedge, what's in that wedge and how do you, given that the environmental community historically has had some sort of mixed feelings about biomass or particular types of biomass and so we're trying to figure out, really, how do you use biomass sustainably to get to these big projections that everyone seems to agree is needed?

And, so we partnered with a coalition of universities and national research labs on a project called "The Role for Biomass in America's Energy Future," and really asked the question, "how can you get – how much can you get from biofuels in a sustainable way?"

And the answer that we found not just at sort of where the technology has been, which is sort of the traditional approach to this, but really trying to look at a dynamic picture forward. Not just what the – how the technologies will improve both on the production side and the feedstock side, but also looking at the whole context: how our demand will change over time and how our policies can change over time.

I think you really have to look at it that way, because if you just try to project from historic performance and current technologies, it is hard to get to see a large role. But we found you can make a really big impact if you're willing to make a national commitment.

Our analysis showed that by 2050, we could basically eliminate our demand for gasoline using a mixture of vehicle efficiency, smart growth, and advanced biofuels. I think it's crucial to understand that those two things – the demand side of the equation and the supply side of the equation – are really linked and linked through the environment most crucially. Because if we try to go out and – even using the best technologies on the supply side, and meet all of the oil growth – oil demand that we expect over the next 50 years or so, we are going to have a land use problem, whereas if we can improve the vehicle efficiency – double the vehicle efficiency, you double the yield, basically, from each acre of land.

We also found that the advanced technologies – building off the same sort of technologies that John was talking about, it takes – there's research and development to be done here, but this is not – there are no challenges here that we don't think we can overcome. And these technologies move us to a biofuels industry that really has big environmental benefits: much greater carbon, or greenhouse gas emission reductions than current biofuels, which do produce greenhouse gas emission reductions, but we need more if we're really going to address our climate change problems. Feedstocks that can really sequester more carbon in the ground, reduce our fertilizer use, reduce erosion, reduce our draw of water from aquifers. So there's a real environmental win here. It's not just a good investment for America or a good investment for agriculture. It's a real crucial investment, we think, for the environment.

MR. STERN: Thanks. Let me just ask you a quick follow up. There was a point that Jason Clay on the panel this morning made, and I think you may have just addressed it, but I want to try to nail that down. He said that if you use cellulosic biomass, which is clearly what we're talking about doing and what's the centerpiece in the NRDC report, that you would actually increase the net loss of carbon that exists right now from farming. And you talked a minute ago about improving feedstocks so there would be greater carbon retention and things like that, but I wanted to just give you an opportunity to answer that concern which Jason raised this morning.

MR. GREENE: Yeah. I think it's crucial to recognize that there are major changes that are going on in the agricultural sector today. We see a tremendous trend toward no-till agriculture that is really changing the environmental footprint of the agricultural sector and allowing tremendous gains in productivity without corresponding increases in impacts, but the – moving towards evolving the industry to cellulosic technology really does offer sort of a next step – a much bigger step forward on reducing those impacts.

We happened to look, specifically in our work, at switch grass, which is a perennial grass. It's just one feedstock and I think that's important. We painted one path to a big impact – a sustainable path. I think there are many paths out there and once we start down it, we'll find there're other ones. But the fact that there is one out there that does, through using the perennial grass, where you have a root stock that holds the soil together over the winter. It, being perennial, doesn't need the fertilizer inputs, the pesticide inputs to start up each year; and it's also a native prairie grass so it's much more adapted to the water supply throughout particularly its primary growing areas, which are throughout the Great Plains and into the Southeast. So it's more naturally and better adapted to those climates. But I think we'll see sort of – again, and I think this a point that both Ralph and Read made, if we provide the farmers the right incentives, send them the signals on the environmental benefits that we want them to provide, that they'll provide it. They can do it. These are innovative and smart guys and they'll figure out how to do this. I think it's a question of setting the path right.

MR. STERN: Good. Thanks.

Read, let me come back to you for a moment now, and let me propose this from the perspective of people who might be skeptical. The promise, in one way or another, of biofuels or alternative fuels has been discussed at some level for quite a while, probably since the first oil shocks back in the seventies and up until now it hasn't really taken off, although there's no question that there's been a significant growth in the use of ethanol. But I guess the question comes back to whether you think that there's a moment now that the case could be made to farmers in a way that hasn't been the case before, and whether whatever the underlying causes for the market not to have developed that much before, whether farmers are traditionalists or the price point didn't seem right or the market didn't seem to be there. Something leads you – leads everybody up here, but that leads you to think that a breakthrough is possible to be made now in going forward and I just wondered what you could just share what your thought is about that.

MR. SMITH: You know, it may come as a surprise to the people in this room – there are only a small handful of farmers in this room – but farmers don't want subsidies. We don't want to be at the public trough. We don't want to portray the image that we are part of the problem instead of part of the solution. We see the whole renewable energy sector as a way to redefine ourselves to you – to our public.

Most of you are probably two or three generations removed from the time when your ancestors or your family were once involved in agriculture. There's only 1 percent

of us now; and, actually, of that 1 percent, probably 10 percent of that 1 percent actually produce most of what you eat; so we're talking about a very small community. Quite frankly, we're tired of what's been going on the last 60 years. We're sick and tired of it. If it hasn't worked, it's not going to work, so let's try something new.

We see energy and the production of energy as a tremendous historic opportunity for agriculture to become part of the solution instead of part of the problem. So I think all of us that have taken the time to look at the opportunity that's out there, are very excited about the future. Many of our peers at home are not, and so just bear with us as we transition into this new economy because it's not going to happen quickly. We're going to need a little help along the way, but we want to get there for the same reasons you want us there. So hopefully we'll get there, and we'll get there as soon as we can.

I would like to invite each of you that are here to come back here on the 7th and 8th of March and – actually it's in this very room, and we're going to continue the discussions of our renewable energy opportunities in agriculture and forestry, and hopefully many of you can help us get to the point where we can see this new vision.

Included in your packet was a brochure on ag energy and there is a section in there that includes an endorsement for this project. You could help us realize this vision by having your organization group endorse that vision; and it just broadens the base so that we can help our government, our president, our Congress grasp this as a national initiative.

Thank you.

MR. STERN: Good. Thanks.

John, let me skip to you. What kind of – first of all, I want to give you an opportunity to talk about the biorefinery, but in that context – in sort of a broader context, what from your perspective, from DuPont's perspective, is the role that the government needs to play to help advance a biobased energy future?

It is – I think biomass technology has often been viewed as not ready for primetime. In order to get it to the point where it really is there and people see it being there, what's the role the policy community needs to be to help business and farmers from your perspective?

MR. RANIERI: Well, I think we have a very good example – actually Read and Nathanael made two very good points in terms of this really is something that can happen; and, it really can transform. And, in reading the "25 by '25" plan, it's interesting – I don't know if your European counterparts have said 2020 is what their goal is and they're actually, policy-wise, looking to see how they could also come up with alternatives, both from the biodiesel standpoint and ethanol.

What's interesting, as I said three years ago, the DOE came up with a bid to say, "Hey, we're trying to get at these biorefineries." But, what's a biorefinery? It's what you're saying, the switch grass – an energy crop. You see, right now we're dependent on using sugar, whether taking cornstarch, the corn kernels off, converting that to sugar or sugarcane – you know, feeding the yeast and having ethanol made.

What really transformed and changed the game that Read is saying, is – again, everything is carbon, whether it's oil you pull out of the ground, it's cornstarch or sugar. Well, the stalks and the husks are cellulosic carbon, so why is that important? How is that related to energy? What we need to do is come up with the biological know-how, the technological know-how to be able to take this biomass that Read's talking about and be able to convert that cellulose into sugar.

So right now we can't get at the large opportunity that Read is talking about, of replacing a large part of the gasoline consumed today. Today, I think, biofuel is 3 or 4 percent of the overall total, and we might double that up to 7 percent is what the new energy bill, I think, says. But what would change the game is coming up with the know-how to be able to have an energy crop, take that, treat it with an enzyme that would convert that to a usable sugar, to engineer the organism that would make ethanol effective and to take all that sugar in, and allow for the volume that you'd need to replace the enormous amount of gasoline used, and at the same time lower the price point where you get the efficiency that you're really looking for.

Now, what the government has done very smartly was to have a co-investment strategy where they – for every dollar we put in, they put in a dollar. We put partners together. We started with – you know, we have our own pioneer looking at the seed that would basically come up with the biomass that would be most suitable to be then broken down into sugar by enzymes. We're working with Diversa in California involving enzymes to move that cellulose to sugar. And then we're looking – internally looking at that ethanology (ph), as you say, to take that sugar and convert it into ethanol.

So putting those pieces together right from the seed all the way down to making the biofuel really is what's needed. And the government stepped up – and again, this is before oil prices went up dramatically, so there was some real foresight here. And we're, right now, putting that know-how – that biosoftware we call it – together to come up with a value chain that makes sense – that we can actually convert that biomass and then that could be used wherever. That know-how you can use equally as well in Iowa as Connecticut, for example, to convert biomass into ethanol and do it in a much more economically beneficial way. But it takes smart thinking about it. It's putting pieces together.

You brought up a point that I agree with, is that the pieces are here. It's not dramatic innovation. It's hard work. There is innovation that has to happen, but it's about putting those pieces together and having a desire and will to do it.

The "25 by '25" is something that is absolutely achievable. We just have to smartly direct the technologies so that we can meet those needs. And everybody wins because right now the high price of gasoline isn't exactly being reinvested in our country. And we're actually very favorably blessed with agricultural land that is probably some of the best in the world. And we're not taking advantage of it and probably could.

But the biorefinery is a very interesting example of how you could do that because you can then bolt on not only about moving the cornstarch, it's taking the stalks as well and then move that to sugar, another crop that a farmer than take advantage of and make a profit on – moving that to ethanol and using that. So it really is an exciting time, but the technology also is there to be able to do this and we can consider doing this.

We've taken a lot of the know-how that over the last 30 years – biotech is only 30 years old. It started in the farmer area. About 20 years ago it moved into agriculture. Now it's moving into the industrial spaces where we're taking the know-how of how to design, how to move enzymes, how to engineer organisms to make things of value, and taken the toolkits that were developed in the other two market spaces and moving them into industrial spaces. So it really is an exciting time and one that you can really see where putting the pieces together effectively will make them economically viable.

MR. STERN: John, do you – is it your sense that the government role now is about right or that there needs to be greater either government investment or government policy to incentivize this kind of investment on the part of the private sector?

MR. RANIERI: I think it's a smart investment and I think the biorefinery, again, is a very good example of a very smart – looking at the innovation that's needed and realizing that they're going have to really incentivize this because this is far out. I mean, these are going take several years. We're going have to build a pilot plant in about a year and a half and the government has indicated that they're looking to assist and help in that matter.

On the market side, I guess it comes down to the question – it's a good question – is it's a mindset that we really have the mandate to really push and develop this technology that's needed to allow for these biological technologies to make it into the industrial space. And the more, I think, incentives that have been done on the back end, on the technology side, for example on the biorefinery, I think would be very helpful. And from the market perspective, encouraging preferential purchasing of these types of products I think would really help as well.

MR. STERN: Thanks.

Nathanael, let me turn to you and just kind of follow up on this policy question both from a perspective – whether it's from a perspective of increasing going to consumer market or any other policy perspective that you think is important. To some degree there obviously were positive measures adopted in the context of the energy act that was passed last summer.

Can you give us your perspective, both on the way in which that law might help, the way in which that law might not go far enough, and other kinds of policies that you think the government ought to be trying to pursue in order to really drive this?

MR. GREENE: Definitely. Let me just take a step back though, because I had the pleasure right before this of speaking at the Farm Journal Forum, which is an annual forum held by the Farm Journal, which is one of the major trade journals in the agricultural community.

And afterwards, a farmer from North Dakota came up and said exactly what we're hearing from Ralph and Read; that he is actually – he finds it humiliating to have to keep taking the subsidies that his industry has become so addicted to in the last six years. And his question to me was, "Do the politicians have enough guts to get us off these subsidies?" which I was, sort of, whoa, and I wasn't sure I had the confidence to say, "Yeah, they'll do it."

But what we both agreed is if we could light a big fire underneath them, then they would probably do it. And I think that that's – we are in a really kind of exciting moment where there is a potential for sort of new alliances to form around these ideas and to really reshape some of the politics. I think the Energy Policy Act that you brought up is a sign of sort of a congressional excitement around biofuels. In the growing energy (part?) you mentioned, we thought we were reaching pretty far in making recommendations that amounted to about $2 billion dollars over 10 years in different types of policies.

The Energy Policy Act actually has $4.2 billion, more than twice what we recommended, for advanced biofuels – not worth the paper it's written on unless it's appropriated. Those are all authorizations. So there's a lot of stuff in the Energy Policy Act that reads pretty well on paper that really won't do anything unless we really follow up on it. I think the pieces that will do something, regardless of appropriations, are the mandates. So the renewable fuel standard, while not doing everything we would have liked to see in the area of protecting air quality, it did do quite a lot in that area and also, obviously, it's going to really drive the market substantially.

There's a specific component of the RFS that is devoted to cellulosic biofuels: 250 million gallons by 2013. There's also a new piece of legislation that was introduced in both the House and the Senate just before Thanksgiving with a very cumbersome name that I can't possibly remember, but it's based on a recommendation plan put forward by something known as a "Set America Free Coalition," which I think is a perfect example of these new alliances that I mentioned.

The "Set America Free Coalition" is a coalition of national security hawks and environmental groups. And the heart of the legislation is a mandate that the federal government save 2.5 million barrels of oil a day by 2015, and that that amount increase after that.

Politically, the sort of almost staggering thing is the spectrum of cosponsors. In the House, the vice chair of the Republican Caucus Conference, Representative Kingston, is the lead co-sponsor. In the Senate, you have Senator Lieberman and Senator Brownback, among others. It's really an impressive spread of conservative Republicans and Democrats getting behind the idea of oil savings as a national priority. And it put biofuels very clearly into that context, which I think moving forward on the policy question is really the crucial – a crucial step is to reframe biofuels from being an agricultural, rural economy issue, which has often created a lot of tension between the rural economies and the urban economies, and really reframing it in terms of a national priority, and Read has talked about that as sort of the goal of the "25 by '25" Coalition. I think that's exactly the right direction (and necessary?) broadness.

MR. STERN: Good.

Ralph, let me ask you one quick question and then we are going to take a few from the audience. This 2007 farm bill is actually just around the corner. Do you – what do you think about the timing – whether the timing is right politically for a real push in the way of renewables and biobased energy in the context of the farm bill?

MR. GROSSI: Well, I guess that the initial disclaimer is that none of us knows what it will be like in June and July of 2007 when the committees will be writing the farm bill and farm policy tends to be a second tier issue that often gets traded off against other priorities. So having said that, by then the Doha development round should be wrapped up, one way or another, so we'll know what the new international directives and constraints are.

Certainly, the budget situation doesn't look like it will be any better by then, given all the other priorities, so the timing looks pretty good to have a real national discussion about the federal role in the farm economy. And I don't think we've had that discussion in a long time in this country; maybe not since Henry Wallace went to Congress in 1933 with the Agricultural Stabilization Act. Here we are seventy-some years later still talking about farm programs. Those, incidentally, were supposed to be temporary programs.

So the timing is good for a national discussion about it; certainly right for asking the question, "what is the role of the federal government in supporting private enterprise, farm economy?" We may have different answers than we had in 1933 or 1973 or 1981. And it's time for that kind of open discussion about what are the priorities, what are the principles around which we base future farm policy? And so I think the timing on that is very good.

I think there's another issue that's just below the surface here that I'd just like to throw out. I don't want to be the skunk at the garden party here, but I do want to raise this issue because we have an increasingly intense competition for land in this country; for urban purposes, for environmental purposes, for agricultural purposes, and now a new major use coming on the horizon: industrial purposes. We have to have a debate about

land use, and it's a delicate thing to have at the federal level because land use planning, land allocation, if you will, is relegated to the states and local governments in our country, as it should be.

But, we do have to raise the question, is there a role for the federal government to at least promote a discussion, to provide incentives for communities to do a better job of land use planning, of how we allocate land as a society. We're going to have, instead of six billion people on this globe, maybe nine or 10 billion people by the middle of the century. We have to feed them all. We'll have to provide other industrial products. There's a major competition on the horizon for land and there is a question about is there a federal role in promoting better planning of land use?

MR. STERN: All right. Let me thank you very much, all of you. I think we have about ten minutes or so left; and let me open the floor. Could you please stand up, identify yourself, and if you have a question for one person, say so. If it's for the panel, say so.

Q: I'm Nick Berry, Foreign Policy Forum. I guess the audience has to come to the conclusion that the surge towards renewables is directly related to high oil prices, but you haven't dealt with the stability of high oil prices to sustain renewables. It seems that there are three factors that have produced high oil prices. India and China now, I think, account for 40 percent of new demand for oil; and, quite frankly, the Pentagon, which now consumes hundreds of thousands of barrels of oil a day. Do you see this as a long-term trend for the demand for oil and, therefore, very high prices that will sustain renewables?

MR. STERN: Do you want to take that, Nathanael?

MR. GREENE: I think it's a really crucial question. There was a great Resources for the Future study a few years ago that looked at renewables, looked at their cost projections over time and their deployment projections over time. And the great – first graph – the cost projections is wonderful. We keep beating the cost projections for renewable technology. They keep getting cheaper and cheaper.

Look at the deployment graph and it's abysmal. We never get actually into the market and it's because the fossil fuel technologies keep coming in cheaper and cheaper. They advance as well. So I think your question is really crucial. Oil could easily go down, become cheaper again, and that would really drop the market – the bottom out of the market if we aren't doing something to address that.

I think the renewable fuel standards are crucial policy tools for that reason, because they do mandate a certain level of use that pushes the infrastructure out there. I'm not a petroleum expert, but there seems to be relative agreement, even EIA says we'll pass peak oil production sometime in the next few decades, and they tend to be viewed as globally the most optimistic. So at some point we'll pass the point – we'll pass the period

of cheap oil and into a period at least of great volatility, if not actual sustained high prices.

Either one, sustained high prices or sustained volatility, will drive the market for renewables, or particularly biofuels, eventually, but I think we need the policy backstop to get us to a point that we're ready to take advantage of it. And advanced technologies are studied to look at the cost and actually come in cheaper than oil except in the most extreme circumstances.

MR. STERN: Another one? Yes.

Q: I'm (inaudible) and I'm an environmental lawyer working for the International Union for Conservation of Nature on a model national law that promotes sustainable soils, and my questions go to Mr. Smith and Mr. Grossi on what you would most like to see in the upcoming farm bill. And I want to tell you what I most want to see and hear: your outrage. I interviewed more than 250 people for the project with a lot of help from the NACD and the state associations and found that all the states had – many of them – the model statute that the NACD drafted, but none of them enforced it. The state of Illinois did not have – which has got the most stringent law, doesn't enforce it.

What about putting in the farm bill a provision that after a certain date, allowing the states to build capability, that payments to farmers will not be made in states that do not enforce their soil laws? How about putting that in the farm bill? But then after you say "no way," (laughter) tell me what you would like to see in the farm bill. (Laughter.)

MR. STERN: Do you want to take that, Read?

MR. SMITH: All right. I'll start if Ralph will back me up.

MR. GREENE: Well, that remains to be seen. (Laughter.)

MR. SMITH: I learned a long time ago, you can effect change with the farm sector a lot better with a carrot than a stick. And I've seen the stick tried before and it has failed every time because farmers are so inventive that they'll find a way to get around something. Conservation compliance is a perfect example of a good idea that didn't work.

In the farm bill, we have an underused tool that would really solve both of those problems, and that's a conservation security program. It's the first time there has ever been an incentive-based program that rewards producers for good stewardship. If you combined that with a new energy policy in the farm bill that would encourage and incentivize renewables, you'd have a wonderful team of incentives that will move us in the direction we can get us weaned off of those (amber like?) payments. And I'm not even going to suggest that we redirect things. I'll let the decision-makers decide on those, but there is a way to do this and there is a way agriculture will follow.

MR. GROSSI: I'll take a slightly different tack. I think you're – any good public policy needs both carrots and sticks. Incentives cost too much if you don't have the right regulatory framework in which they operate, and we've seen that many times over and in many cases. There's a real problem; I alluded to it in this issue that I raised earlier about competition for land. Clearly, there's environmental risk here if we intensify land use by bringing in new demand from industrial uses or products, but we're all for raising incomes in the farm sector and raising prices so they can make a decent income.

I do think that when you're asking the public to spend, this year, somewhere between $30 and $40 billion in the farm sector – in farm subsidies, in insurance subsidies, in conservation payments – it easily will exceed $30 billion this year and if you really added it all up it's probably closer to $50 billion with all the other infrastructure in place. We're asking the public to spend that kind of money on private-sector agriculture, and we're not really looking for accountability for the expenditure of those dollars. That has been a challenge in agriculture for a long time. We spread the money around. It's not well-targeted toward achieving real environmental benefit. I think that's a challenge in the next farm bill. We do have to have better accountability.

We might go down the track that you are suggesting, Bill, or at least we should put this idea on the table. It goes back to the cross-compliance issue. If a farmer is going to get a check from the government, shouldn't they at least be farming in a sustainable fashion? Shouldn't they at least be maintaining the land in good condition in order to qualify for that check? We have half a program right now in conservation compliance and it's not enforced.

MR. STERN: Good. I think I'm getting the – do we have time for another question or am I getting the cut sign? I can't find – I'm getting the cut sign. I'm sorry.

Let me thank all of our panelists here. I think this was terrific. I think what we have heard, in a nutshell, is that there is really tremendous potential here to develop an agriculture-based energy program and policy that can make a real major difference, and we need to make a major difference with respect to those challenges that we mentioned at the outset regarding the economy and national security on the one side, the subsidies that are such a significant problem with respect to tackling global poverty and our trade relations, and the environment. And that these are challenges that can be addressed through the development of bioenergy in ways that are really materially helpful to farmers and business and the environment. So I think that it is going to be critical for the right policy framework to be put in place. I think that, as our panelists have said, there is – there have been – were some steps in the right direction made in the Energy Policy Act that was passed last summer. There's more to be done there and, again, I thank them all. Thank you all.

I'm told to tell you to stay in your seats and that lunch is coming soon, and Senator Lugar will speak at lunch and we'll have panels in the afternoon. So thank you very much.

(Applause.)